

Appendix O

National Hydrography Requirements and Benefits Study

Glossary of Terms

Anadromous: A fish that is born in fresh water, spends most of its life in the sea and returns to fresh water to spawn. Salmon, smelt, shad, striped bass, and sturgeon are common examples.

ArcHydro: An ArcGIS-based system designed to support water resources applications. ArcHydro consists of a common data model and a set of GIS tools to support geospatial and temporal data analyses.

ArcGIS: A Geographic Information System (GIS) developed by the Environmental Systems Research Institute (Esri) for working with maps and geospatial information. ArcGIS encompasses a suite of GIS products for use on various platforms (desktop, server, mobile) and extensions customized for specific functionality and industries.

ArcMap: An Esri GIS application for viewing, editing, querying, and analyzing geospatial data and making maps. ArcMap is a component of ArcGIS.

Bathymetry: The study of the "beds" or "floors" of waterbodies, including the ocean, rivers, streams, and lakes. The term "bathymetry" originally referred to the ocean's depth relative to sea level, although it has come to mean "submarine topography," or the depths and shapes of underwater terrain. In the same way that topographic maps represent the three-dimensional features (or relief) of overland terrain; bathymetric maps illustrate the land that lies underwater. Variations in sea floor relief may be depicted by color and contour lines called depth contours or isobaths.

Benefit: The benefit, including potential savings, realized by the responding agency, improved services to customers (citizens), and value realized by others as a result of having a requirement met.

Bioretention: A stormwater management technique that involves directing stormwater runoff into shallow basins where the water can percolate through native soils for on-site treatment or can be directed into nearby stormwater drains or receiving waters.

Breakline: A linear feature that describes a change in smoothness or continuity of a surface. Shorelines of rivers, lakes, and other hydrographic features form the breaklines between the water surface and the slope of the adjacent land. Such breaklines, when combined with terrain data, are used to establish the direction of flow of rivers and streams.

Business Use: A Business Use is an accumulation of the related MCAs of Federal and State agencies, tribes, selected water management, and private sector organizations that require hydrography information. For example, monitor river flows, runoff, groundwater, streamflow simulation, and stormwater management would all be grouped together under a "River and stream flow management" Business Use. A list of Business Uses is provided in Appendix A.

Cowardin Classification: A classification system developed by Cowardin et al (1979) to characterize wetland habitat. The wetland classification codes are a series of letter and number codes that have been developed to adapt the national wetland classification system to map form.

Flowline: A network of hydrography features that is characterized by having flow direction such that water can be traced downstream or upstream. The National Hydrography Dataset (NHD) includes flowlines for stream segments and inside waterbodies so that the flow of water can be traced across the landscape.

Geodatabase: An object-relational database designed to store spatial features (points, lines, polygons) and their attributes. Geodatabases can also contain topology information about the spatial features. A geodatabase stores spatial data in feature classes, which are sets of features; non-spatial data can also be stored in tables. Relationships can be established between spatial features and tables within a geodatabase.

Geographic Information System (GIS): A system of computer hardware, software, and procedures designed to support the capture, management, manipulation, analysis, modeling, and display of spatially referenced data for solving complex planning and management problems.

Hydrologic and Hydraulic (H&H) Modeling: An engineering analysis of flooding sources. Hydrologic modeling is carried out to establish peak flood discharges and their frequencies of occurrence. Hydraulic modeling uses the hydrologic flood discharge values coupled with floodplain characteristic data to simulate flow conditions and determine flood elevations. H&H analyses are conducted for flood risk analysis, dam break analysis, and bridge design, among other uses.

Hydrostratigraphy: The structure of subsurface porous materials in reference to the flow of groundwater. A hydrostratigraphic unit can be defined as a body of rock distinguished and characterized by its porosity and permeability. Delineation of these units subdivides the geologic framework into relatively more or less permeable portions and thus aids in definition of groundwater flow systems.

Karst: A terrain with distinctive landforms and hydrology created from the dissolution of soluble rocks, principally limestone and dolomite. Karst terrain is characterized by springs, caves, sinkholes, and a unique hydrogeology that results in aquifers that are highly productive but extremely vulnerable to contamination. In the United States, about 40% of the groundwater used for drinking comes from karst aquifers.

Lidar: Lidar, which stands for Light Detection and Ranging, is a remote sensing method that uses light in the form of a pulsed laser to measure ranges (variable distances) to the Earth. These light pulses—combined with other data recorded by the airborne system— generate precise, three-dimensional information about the shape of the Earth and its surface characteristics.

Macroinvertebrate: An animal without a backbone that can be seen with the naked eye. Most are bottom-dwelling animals. Included are crustaceans, worms, and aquatic insects.

Microsoft®: A U.S. company that develops and sells computer software, hardware, and services. Microsoft is best known for its office suite which includes Excel, Word, Visio, PowerPoint as well as Internet Explorer.

Mission Critical Activity (MCA): A Mission Critical Activity is a primary activity undertaken by an agency. In this case, the MCAs will all require some hydrography information. For example, one MCA for FEMA would be floodplain or flood risk mapping; one MCA for EPA would be water quality reporting; another MCA would be coastal mapping as performed by NOAA, USACE, and some states; etc.

Morphometry: The quantitative analysis of the size and shape of landforms, organisms, and other objects.

Orthoimagery: An orthoimage is a uniform-scale image where corrections have been made for feature displacement such as building tilt and for scale variations caused by terrain relief, sensor geometry, and camera tilt.

Paleochannel: An ancient riverbed that has been filled with sediment. Paleo channels can store and transmit groundwater, and can thus be used as a source of water.

Paleogeography: The study of historical geography, usually of the physical landscape, but it may also include human or cultural environments.

Requirement: A necessary capability, function, data element or data characteristic necessary for an agency to accomplish an MCA.

Sewershed: A catchment defined by its storm drain infrastructure. Where a watershed refers to the area that drains to a single point on a stream network, a sewershed is determined by the curbs, storm drains, detention basins, pipes, and outfalls that empty into a common outlet (often a stream).

Shapefile: An Esri GIS file format that stores spatial features and their attributes. Unlike geodatabases, shapefiles can only store one type of spatial feature (point, line, or polygon) per file.

Silviculture: The art and science of controlling the establishment, growth, composition, health and quality of forests and woodlands to meet the diverse needs and values of landowners and society on a sustainable basis. The name is derived from the Latin silvi- (forest) and culture (growth).

Strahler's Stream Order: A method of classification of stream size based on a hierarchy of tributaries developed by Robert Horton (1945) and Arthur Strahler (1952, 1957). Headwater streams are given the order number one. When two first-order streams meet at a confluence, they form a second-order stream and so on downstream. First through third order streams are also called headwater streams. Going up in size and strength, streams that are classified as fourth through sixth order are medium streams while anything larger (up to 12th order) is considered a river. For example, the Ohio River is an eighth order stream while the Mississippi River is a tenth order stream. The world's largest river, the Amazon, is considered a 12th order stream.

SurveyMonkey®: A company that provides customizable on-line cloud-based surveys as well as tools for data analysis, sample selection, bias elimination, and data representation.

Swallet: An underground stream, or an opening through which a stream disappears underground.

Topobathy: Topobathy (short for topobathymetric) data are a merged rendering of both topography (land elevation) and bathymetry (water depth) to provide a single product useful for a variety of applications.

Transboundary: Crossing at least one political border. A transboundary river, for instance, would be one that crosses the U.S.-Canada border.